Name: Date:

Polynomial Factoring solution (version 612)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 8x + 27 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(27)}}{2(1)}$$

$$x = \frac{-(-8) \pm \sqrt{64 - 108}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{-44}}{2}$$

$$x = \frac{8 \pm \sqrt{-4 \cdot 11}}{2}$$

$$x = \frac{8 \pm 2\sqrt{11}\, i}{2}$$

$$x = 4 \pm \sqrt{11}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-8 + 2i$ and $9 + 3i$ in standard form $(a + bi)$.**

Solution

$$(-8 + 2i) \cdot (9 + 3i)$$
$$-72 - 24i + 18i + 6i^2$$
$$-72 - 24i + 18i - 6$$
$$-72 - 6 - 24i + 18i$$
$$-78 - 6i$$

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3. **Write function $f(x) = x^3 + 3x^2 - 22x - 24$ in factored form. I'll give you a hint: one factor is $(x - 4)$.**

Solution

	1	3	-22	-24
4		4	28	24
	1	7	6	0

$$f(x) = (x-4)(x^2+7x+6)$$

$$f(x) = (x-4)(x+6)(x+1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+4)\cdot(x+1)^2\cdot(x-4)^2\cdot(x-7)^2$$

Sketch a graph of polynomial $y = p(x)$.